

WORK PLAN
FOR
PHASE II INVESTIGATION
AT
THE FORMER ISC PROPERTY
(MAGNA METALS)
TOWN OF CORTLANDT
WESTCHESTER COUNTY, NEW YORK
PREPARED FOR
ISC PROPERTIES, INC.

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1.0 SCOPE OF WORK

1.1 Program Objective

The purpose of this work plan is to obtain a sufficient data base to enable an assessment of the environmental impact or degradation, if any, that has resulted from past waste management practices at the former ISC Property (Magna Metals) in Cortlandt, New York. The data obtained by the activities defined in this plan will be used as input to the MITRE ranking system to assess the ranking of this site as compared to sites throughout New York State.

1.2 Technical Approach

After reviewing the existing data and inspecting the site, Ebasco recommends a data collection program consisting of three tasks:

Task I: Sample and Analyze Surface Water, Stream Sediments and Surface Soils

Task II: Geophysical Survey

Task III: Drill and Sample Subsurface Soils, Install Wells, Monitor Groundwater Levels and Quality.

Task I: Surface Sampling

The initial task will consist of a surface water, stream sediment and soil sampling program. In this task, samples will be taken of the distribution tank, leaching pits and selected locations from the soil at the foot of the slope, from the water and sediment in the stream directly downgradient from the pits, water samples from the outlet of the upstream dam, and downstream of the site. Based on observation of the terrain and the stratigraphy of the site, a likely migration path of waste from the pits would be from seeps at the foot of the slope.

Task II: Geophysical Survey

The second task will be a geophysical survey of the area from the base of the slope to the stream extending parallel to the embankment for approximately five hundred feet. Electromagnetic conductivity measurements will be taken on a 100 ft by 100 ft grid which will subsequently be refined to a 50 ft by 50 ft grid pattern. The results of this survey will help to identify the depth to groundwater and the location of any high conductivity dissolved or suspended contaminants resulting from seepage into the surface aquifer. These data will also assist in the determination of the presence and extent of a contaminated plume. The results will be used to confirm the appropriateness of, and possibly adjust, groundwater sampling well locations.

Task III: Well Installation/Groundwater Monitoring

The final task of the field investigation program will be the placement and sampling of groundwater wells. These sampling wells will be located both up and downgradient of the suspected contamination source. Downgradient wells will be positioned to intercept the groundwater flow from the disposal area, in the aquifer suspected to be contaminated. In this work plan it has been assumed that a total of six sampling wells will be necessary to provide data necessary to comply with the New York State Department of Environmental Conservation (NYSDEC) requirements. However, based on the results of the electromagnetic survey this estimate may be modified by agreement with NYSDEC. The well sampling results will be factored into the hazardous ranking system as specified by NYSDEC.

2.0 COLLECTION, REVIEW AND EVALUATION OF EXISTING DATA

Prior to implementation of this Work Plan, Ebasco will complete the collection, review and evaluation of all available existing data on the former ISC Property (Magna Metals) site. These desired data are subsurface soil and groundwater characteristics and chemical sampling and testing results.

2.1 Subsurface Characteristics

Existing subsurface data regarding the site and site region are contained in the following:

- o Test pit logs recorded during site investigations by Baker Properties for the new and proposed buildings;
- o Historical and construction records of the nearby New Croton Dam and Reservoir; and
- o The Final Safety Analysis Report (FSAR) from the nearby Indian Point Nuclear Power Plant in the town of Buchanan, N.Y.

The above data has been collected and reviewed in order to determine typical soil types and formations and the approximate depth to bedrock. This data will be used in conjunction with the geophysical survey to refine the well drilling locations. This will maximize the cost-effectiveness of the Field Sampling Plan, described in Section 3.0.

2.2 Chemical Analysis

In 1982, General Testing Corporation collected and analyzed leaching pit samples for selected trace metals, cyanides, phenols, sulfate, nitrates and chlorides. The results of EP toxicity analysis (4 samples) indicated no apparent metal leaching problems. Sulfates, nitrates and chlorides were

present at concentrations less than NYS Ambient Water Quality Standards of 250, 10 and 250 mg/l, respectively (TOGS 85-W-38); in addition, these inorganics generally have low toxicity and are present as background constituents.

On December 29, 1982, February 1, 2 and March 15, 1983, the Westchester County Health Department conducted additional investigations on the property and in Furnace Brook immediately to the west of the property. The results for the February 2 and March 15 sampling events were available for review. The metal analyses (Feb. 2, 1982 sampling) are summarized in Table 2.1. Except for aesthetic considerations of iron and manganese concentrations at several locations, trace metals in surface water were not found to be elevated (i.e., when compared to NYS Ambient Water Quality Standards). However, several chlorinated volatile organics were detected in Furnace Brook; of major concern were the levels of trichloroethylene (TCE) in the septic tank, a leaching pit off the septic tank and at downstream locations along Furnace Brook and an unnamed tributary.

On May 15, 1984 the NYSDEC Division of Environmental Enforcement resampled at the site, specifically for metals and volatile organic compounds (VOAs). Sludge, sediment and/or surface water samples were collected at four locations along the Brook/tributary, the septic tank, and three sludge pits. The water and sediment/sludge sample results are summarized in Tables 2.2, 2.3, 2.4 and 2.5. By comparing sediment/sludge sample results to typical soil background levels and surface water sample results to NYS Ambient Water Quality Standards, several observations can be noted. Analyses for 12 of the 13 priority pollutant metals analyzed in the surface water samples consistently resulted in low concentrations (i.e., mostly less than detection limits); water samples from the septic tank (05) and sludge pit A (08) did contain elevated As, Se, Cu, Ni and Zn concentrations. Trace metals in sediment samples indicated similar trends, i.e., the 12 priority pollutants were essentially present at background levels (copper was slightly elevated). Sludge samples collected from Pits 4 (06) and 2 (07), however, contained elevated As, Se, Cd, Cr, Cu, Ni, Ag and Zn. EP toxicity tests for the two sludge samples resulted in concentrations below the allowable maximum EP

toxicity concentration (and mostly less than detection limit). The results of trace metal analyses for NYSDEC samples basically confirm findings by the Westchester County Health Department that metals known to be in the leaching pits have apparently not reached Furnace Brook.

The results of VOA analyses on NYSDEC water samples show extremely elevated TCE levels in the septic tank (15,000 ppb) as well as a high concentration (190 ppb) in Pit 4 (see Table 2.5). Sediment and sludge samples also contained high levels of TCE; acetone and trans-1,2-dichloroethene were seen in the Brook sediments, and xylenes and ethylbenzene were detected in sludge samples collected from Pits 4 and 2 (Table 2.4). Consequently, the primary emphasis of the field investigation should be on volatile organics, especially chlorinated species such as TCE.

TABLE 2.1

SUMMARY OF TOTAL METAL AND CYANIDES ANALYSES
WESTCHESTER CO. HEALTH DEPT. SAMPLING ON 2/2/83

COMPOUND	CONCENTRATION (ug/l)					
	(1)					
	NYS AWQ STANDARD		SAMPLE NO.			
	HUMAN HEALTH	AQUATIC LIFE	3	4A	6	7
Iron	300	300	300	340	700	580
Copper	200	(2)	90	100	<20	70
Zinc	300	30	<50	50	<50	<50
Nickel	-	(2)	<10	<10	<10	<10
Cadmium	10	(2)	<2	<2	<2	<2
Chromium	50	(2)	<10	<10	<10	<10
Lead	50	(2)	<10	<10	<10	<10
Manganese	300	-	70	30	520	70
Cyanides	100	5.2	<10	<10	<10	<10

-
- 1) Human health-based and aquatic life-based Ambient Water Quality (AWQ) Standards are for surface water (fresh).
 - 2) Aquatic life-based AWQ Standard or Guidance Value is dependent on water hardness.

TABLE 2.2

SUMMARY OF TOTAL METAL ANALYSES
NYSDEC SURFACE WATER SAMPLING ON 5/15/84

COMPOUND	CONCENTRATION (ug/l)										DETECTION LIMIT
	(1)		SAMPLE NO.								
	NYS AWQ STANDARD		01	02	03	04	05	08			
	HUMAN HEALTH	AQUATIC LIFE									
Arsenic	50	190	<10	<10	<10	<10	550	<10	<10	10	
Antimony	3(2)	-	<10	<10	<10	<10	<10	<10	<10	10	
Selenium	10	1.0	<10	<10	<10	<10	237	91	<10	10	
Thallium	4(2)	8	<10	<10	<10	<10	<10	<10	<10	10	
Mercury	2	0.2(2)	<0.4	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	0.2-0.4	
Beryllium	3(3)	11 or 1,100	<1	<1	<1	<1	<1	<1	<1	1	
Cadmium	10	(3)	<10	<10	<10	11	<10	<10	<10	10	
Chromium	50	(3)	<4	<4	<4	<4	4.2	<4	<4	4	
Copper	200	(3)	<4	<4	<4	6.9*	7,810*	670*	670*	4	
Nickel	-	(3)	<15	<15	<15	<15	610	508	508	15	
Silver	50	0.1	<3	<3	<3	<3	<3	<3	<3	3	
Zinc	300	30	21*	<10*	<10*	17*	261	1,570*	1,570*	10	

* Blank Corrected

- 1) Human health-based and aquatic life-based Ambient Water Quality (AWQ) Standards are for surface water (fresh)
- 2) Guidance Value.
- 3) Aquatic life-based AWQ Standard or Guidance Value is dependent on water hardness.

TABLE 2.3

SUMMARY OF TOTAL METAL ANALYSES
NYSDEC SEDIMENT/SLUDGE SAMPLING ON 5/15/84

COMPOUND	GLOBAL MEDIAN SOIL CONCENTRATION(1)	DETECTION LIMIT	CONCENTRATION (mg/kg)						
			01	02	03	04	06 (Sludge)	07 (Sludge)	
Arsenic	6	0.5	<0.5	0.65	<0.5	<0.5	27.5	5.0	
Antimony	1	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Selenium	0.4	0.5	<0.5	1.8	0.61	<0.5	7.55	13.0	
Thallium	0.2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Mercury	0.06	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Beryllium	0.3	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Cadmium	0.35	1.0	<1	<1	1.2	<1	3.1	1.6	
Chromium	70	0.4	7.5	8.6	21.9	16.9	223	5.7	
Copper	30	0.4	5.7*	115	36.5	100*	3,690*	15,800*	
Nickel	50	1.5	30.1	40.3	56.2	39.8	27,500	13,800	
Silver	0.05	0.3	0.30	<0.3	<0.3	<0.3	0.81	0.70	
Zinc	90	1.0	22.3*	28.2*	37.3	39.9*	8,310*	9,500*	

* Blank Corrected

1) Bowen (1979)

TABLE 2.4

SUMMARY OF VOLATILE ORGANIC ANALYSES
NYSDEC SEDIMENT/SLUDGE SAMPLING 5/15/84

COMPOUND	CONCENTRATION (ug/kg) ^(1,2)					
	01	02	03	04	06	07
Acetone			190	1,400		
Trans-1,2-dichloroethene			300			
Trichloroethene			30	2,700	680	2,600
Vinyl chloride						
Total xylenes					42	7,100
Ethylbenzene						3,300

(1) Blank spaces in table indicate concentrations less than detection limit.

(2) Detection limits are not shown here since they were not included in NYSDEC raw data package.

TABLE 2.5

SUMMARY OF VOLATILE ORGANIC ANALYSES
NYSDEC SURFACE WATER SAMPLING 5/15/84

COMPOUND	CONCENTRATION (ug/l) (1,2)					
	01	02	03	04	05	06
Acetone						
Trans-1,2-dichloroethene				25		16
Trichloroethene		6.6	16	62	15,000	190
Vinyl chloride						
Total xylenes						
Ethylbenzene						

-
- (1) Blank spaces in table indicate concentrations less than detection limit.
- (2) Detection limits are not shown here since they were not included in NYSDEC raw data package.

3.0 FIELD SAMPLING PLAN

The Field Sampling Plan for the site consists of the following three tasks:

- | | |
|----------|---------------------------------------------------------------------------------------------------------|
| Task I | Sample and Analyze Surface Water, Stream Sediment and Surface Soils |
| Task II | Geophysical Survey |
| Task III | Drill and Sample and Analyze Subsurface Soils, Install Wells and Monitor Groundwater Levels and Quality |

The following sections present a detailed description of the plan methodology and schedule. This plan has been developed in accordance with the NYSDEC Generic Work Plan for Phase II Investigations dated 2/85 and the Ebasco Standard Field Sampling Plan for Hazardous Waste Sites.

3.1 Surface Soil, Sediment and Surface Water Sampling

3.1.1 Sample Locations

Twenty-one locations have been selected for collection of a total of 28 surface soil, sediment and surface water samples. The locations, shown in Figure 3.1, were selected based on existing data, the reconnaissance survey of 2/19/86 and review of the site topographic report. Nine soil/sludge samples will be obtained at the contamination sources: the leaching pit and septic tank areas (locations 1-9). In addition, a total of five surface soils samples will be collected; three samples will be collected from surface soil along the base of the slope (locations 10, 12 and 14) and two surface soil samples will be collected west of the stream in the marsh area (locations 19 and 20). Surface water and sediment samples will be obtained from the stream (locations 16 and 17) and tributary (locations 11, 13 and 15). In addition, surface water and sediment samples will be collected at the upstream pond (location 21) for background data and at a downstream area (location 18) in the stream or at the field pond south of the site. The sample collection matrix is shown in Table 3.1.

These sampling locations may be subject to minor modification in the field (of which NYSDEC will be advised) based on difficult site conditions and access as well as the probable seasonal nature of the tributary stream to be sampled.

3.1.2 Chemical Analyses of Surface Samples

Chemical analyses to be performed are based on the review of existing data (Section 2.2). The following chemical analyses are recommended:

- o Hazardous substance list (HSL) volatile organics,
- o Hazardous substance list (HSL) metals,
- o Cyanide, and
- o Phenols.

Due to concern about elevated TCE concentrations at the site, it is recommended that HSL volatile organics be analyzed in all 28 surface water and sediment/soil samples collected at the 21 sampling locations. The analyses will be performed using CLP procedures with full documentation. Cyanide and phenols are also recommended analyses based on known disposal and previous detection levels. HSL metals analyses are included based on known disposal at the site plus elevated tank or pit concentrations of certain trace metals. Only the total concentration of chromium will be analyzed. To confirm earlier findings that the migration of metals from the pits to Furnace Brook is not occurring, it is recommended that samples be collected for analysis of HSL metals at 5 selected locations, i.e., upstream pond (21), downstream area (18), tributary (13,15) and stream (17).

In addition, in concurrence with NYSDEC's request, it is recommended that the samples collected from the nine leaching pits, two wells (2 and 6), one soil location (14), two surface water locations (16 or 17 and 21), and one sediment sampling location (15) be analyzed for the full list of HSL parameters.

Ebasco proposes to use its own laboratory, Hittmann Ebasco Associates Inc. (HEAI), for chemical analyses. HEAI is approved by NYSDEC.

3.1.3 Sample Procedures, Containers and Preservation Methods

Collection, preservation and handling of samples will be in accordance with New York State Contract Lab Protocols (CLP) and EPA recommended procedures.

These methods are summarized in the following subsections. Reagents required for sample preservation will be added to the sample container(s) in the field.

Surface soil and sediment samples will be collected wearing appropriate protective gear as specified by the Health and Safety Officer. Stream sediment samples will be collected moving upstream. Sediment samples will be collected using either a Ponar dredge, scoop, bucket auger, or shovel. For both soils and sediments clean 1-liter glass and VOA containers will be filled with sediment and sealed. Sample logs, labels and chain of custody forms will be used to document all samples. All collected samples will be maintained at approximately 4°C by placing in ice chest or other suitable container.

Surface water samples will be collected wearing appropriate protective gear as specified by the Health and Safety Officer. Grab samples will be directly collected into sample bottles, if possible. Otherwise, they will be initially collected in clean Pyrex containers. Samples will be preserved as specified in Table 3.2. Sample logs, labels and chain of custody forms will be used to document all samples. All water samples will be prepared as summarized in Table 3.2.

Analysis-specific procedures for water sampling are as follows:

VOA

- o Vials of 40-ml capacity or larger equipped with a screw cap having a teflon lined septum will be used.
- o Sample bottles will be filled to overflowing in such a manner that no air bubbles pass through the samples as the bottle is being filled.
- o Sample bottles will be sealed so that no air bubbles are entrapped. Maintain the hermetic seal on the sample bottle until time of analysis.
- o Samples will be iced or refrigerated at 4°C. All samples will be analyzed within 7 days of collection.

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Heavy Metals

- o Two ml 10.0 N nitric acid (HNO_3) per liter of sample will be added in the field. (Confirm that pH is less than 2 with narrow range pH paper.)
- o Samples will be carefully and slowly mixed after capping.
- o Acidified samples will be tested with pH paper to confirm pH is less than 2. If pH is not less than 2, acid will be added dropwise to adjust the pH.
- o Samples will be capped and refrigerated at 4°C. Samples should be analyzed within 6 months with the exception of mercury (28 days).

Total Phenols

- o Sample bottles of appropriate capacity will be used.
- o Samples will be acidified in the field to a pH of slightly less than 4 using phosphoric acid.
- o Samples will be kept at 4°C and analyzed within 28 days of collection.

Total Cyanides

- o Samples will be collected in 500 ml or larger sample bottles.
- o Pre-sample preservation is required to prevent oxidizing agents such as chlorine from decomposing most of the cyanides. To test for oxidizing agents, place a drop of the sample on starch-iodide test paper; a blue color indicates the need for treatment. Ascorbic acid will be added to the sample, a few crystals at a time, until a drop of sample produces no color on the KI-starch paper.

- o Testing for the presence of sulfides will also be performed. Testing will be done with lead acetate paper, which indicates the presence of sulfides by darkening. If sulfides are present, samples will be treated with cadmium carbonate or cadmium nitrate, precipitating yellow cadmium sulfide. Repeat addition of cadmium carbonate or cadmium nitrate until presence of sulfides is no longer indicated. Samples will be filtered to remove precipitate.
- o Samples will be preserved in the field with 2 ml of 10 N sodium hydroxide per liter of sample (pH greater than 12) at time of collection. Samples will be kept at 4°C and analyzed within 14 days.

3.2 Geophysical Survey

A geophysical reconnaissance survey will be performed to identify the lateral extent and depth of possible contaminant migration and to assist in locating contaminant sources. As the first level of site investigation, it is proposed that the project area be surveyed over a 500 ft by 400 ft area with a Geonics EM-31 terrain conductivity meter. The geophysical survey will initially be performed on a 100 ft by 100 ft grid pattern which will be refined to a 50 ft x 50 ft grid spacing as shown in Figure 3.2. Depth soundings will be conducted at selected locations in order to determine conductivity contrasts with depth (e.g., from variations in contaminant concentrations, lithology). This survey will also provide preliminary information on the depth to bedrock. In conjunction with the conductivity investigation, resistivity measurements will be made in selected concurrent lines for corroboration.

A terrain conductivity survey gives real time data and will require little post-field data reduction and interpretation. The success of this geophysical tool in meeting its intended investigative purpose will be continuously evaluated by our geophysical survey team. In support of this, stratigraphy outside of the contaminant plume will be profiled to provide background levels, allowing a qualitative calibration of the geophysical survey. Adverse conditions (buried water mains, sprinkler systems, power line, fencing, etc.) might preclude the use of a terrain conductivity survey in certain areas of the project site although this is not expected.

3.3 Subsurface Investigation

The subsurface investigation will consist of six test borings drilled to approximately 30 ft deep (with actual depths depending on field conditions), with soil sampling and analysis followed by installation of a groundwater monitoring well in each borehole. The wells will then be developed and the groundwater sampled and analyzed. The methodology for this procedure is presented in the following paragraphs.

3.3.1 Boring/Well Locations

The selected preliminary boring/well locations are shown in Figure 3.3. The location of Well No. 1 is expected to be slightly off to one side of the plume and will aid in determining the direction of groundwater flow and possibly background groundwater quality data. The locations of Wells No. 2, 3 and 4 are expected to be directly downgradient of the contaminant source. These wells will aid in defining the vertical and horizontal extent of soil contamination and the horizontal extent of groundwater contamination. Wells No. 5 and 6 locations are thought to be upgradient of the source and will also aid in determining the direction of groundwater flow as well as providing background water quality data.

3.3.2 Procedures for Drilling, Installation and Sampling of Groundwater Monitoring Wells

Drilling/Soil Sampling

The test borings with subsequent well installations will be located and installed to best define the soil profile, soil contamination and contaminant groundwater plumes. The locations of the borings will be reconfirmed after assessing the results of the geophysical reconnaissance survey.

Prior to any subsurface work, the area will be screened with a metal detector to aid in avoiding underground utilities or metal debris. During the boring program, Ebasco will monitor air quality around the boreholes as part of its health and safety program. Monitoring will be performed using HNu or OVA

instruments. Readings will be compared to background readings taken by Ebasco at selected site locations prior to the initiation of the boring program.

Split-spoon sampling will be performed continuously from the surface to the bottom of the boring to provide a continuous boring log. These logs will include the following:

- Physical characteristics and grain size distribution of samples (using the Unified Soil Classification),
- Blow counts for driving the sampler (standard penetration resistance),
- Presence of any visible contaminants,
- Color changes,
- Groundwater level,
- Thickness of individual units, and
- Any other conditions encountered during drilling.

Drilling and sampling methods will conform to the appropriate ASTM and regulatory agency standards, and this document.

Jointly selected split-spoon samples will be analyzed in the laboratory for volatile organics and metals. Soil samples will be collected continuously at all test borings. Soil samples will be taken from the center of each split-spoon, or sections of the split-spoon which are visibly contaminated, or sections which are found to be contaminated by use of direct reading instruments (i.e. HNU, OVA, H₂S, etc.). Part of each split-spoon sample will be placed directly into the VOA container and part into the metals container. The containers will be immediately sealed, set aside and the headspace of the metals containers analyzed after completion of the borehole in order to aid in the selection of the samples to be sent for laboratory analysis.

If high-permeability soils are encountered above the water table (unsaturated soils), a composited sample taken over the entire high-permeability zone may be taken for metals analysis. The composited sample will be obtained by collecting soil from the center of each split-spoon within the zone and compositing in a stainless steel bucket and then placing soil in an appropriate container.

Information from these samples will help to determine potential contaminant levels in groundwater which may represent a health hazard. In addition, representative saturated soil samples from test borings will be taken and laboratory tested to determine the grain size distribution (sieve and possibly hydrometer analysis) and to confirm field identifications.

The following general procedures will be followed for collecting soil samples at boreholes.

- o Split spoons will be collected wearing protective gear as specified by the Health and Safety Officer.
- o Each soil sample will be geologically logged.
- o Soil will be removed from the split-spoon sampler using a clean stainless steel spoon. Sections of each split-spoon to be collected for analysis will be determined by one of the following: a) signs of visual contamination; b) contamination as measured by direct reading instruments (i.e., OVA, HNU, etc.); or c) center or lower portion of each split-spoon. VOA vials will be directly filled from the split-spoon(s) and completely filled. Metals bottles should be filled immediately after soil is removed from split-spoon or after soil is composited in a stainless steel bucket.
- o Samples will be logged, labeled and documented on chain-of-custody forms.
- o Both unsaturated and saturated samples will be selected for lab analysis by taking PID reading in headspace of metal sample bottles.
- o Selected samples will be maintained at approximately 4°C by placing in an ice chest or other suitable container.

Soil sample storage and handling requirements will be in accordance with NYS CLP or, if not specified therein, with appropriate EPA test methods.

Well Installation

Based upon limited knowledge of the site at this time, all borings will be drilled utilizing hydraulic rotary techniques, commencing with a hollow stem auger having a minimum inside diameter of 3 3/4 inches. In the event that hollow stem augering is not successful in advancing the borehole, mud rotary methods using bentonite drilling mud will be employed. The approval of the NYSDEC on-site representative will be obtained prior to the use of bentonite drilling muds. A mud tub will be used. A sample of drilling mud will be submitted for chemical analysis of those parameters for which groundwater samples are to be analyzed.

Wells will be constructed in all boreholes using two (2) inch diameter stainless steel riser and No. 20 slot stainless steel screens. The selection of construction material is determined by the anticipated contamination type(s) and their reactivity with well construction material. Sand packed around the screens will be medium-size filter sand. A typical well installation is shown in Figure 3.4. The type of screening to be used will depend in part on the grain size of the subsurface soils. If extremely fine grained sediments are encountered, No. 10 slot screen may be employed. The exact screening intervals for monitoring wells will be determined jointly in the field based on geologic considerations and HNu/OVA readings.

A decision regarding the appropriateness of one well being completed to bedrock (if less than 50 ft deep) will be made in the field. If well installation in bedrock is required, the well construction details will be in general accordance with those shown in Figure 3.5. NYSDEC approved methods for well completion, including sealing of the annulus and seating of the riser pipe will be employed. Appendix B contains further information on drilling methods and well installation.

Well Development

After installation, each well will be developed in order to stabilize and increase the permeability of the sand pack around the well screen and of the adjacent formation which has been potentially reduced during drilling

operations. The wells will be developed by overpumping and backwashing. With this method, the water level is alternately drawn down at a high rate (by pumping or bailing) and then reversing the flow direction (backwashing) so that water flows from the well into the surrounding formation. Backwashing will be performed by pouring water into the well. NYSDEC approval will be obtained prior to the addition of any external water for use in well development. (Well development is also discussed in Appendix B.) All well development and evacuation water will be collected, stored and disposed of in a manner which is acceptable to NYSDEC. The efficiency of well development will be determined by visual clarity and turbidity measurements. Conductivity and pH measurements may be used to supplement these measurements.

Well Sampling

Water level measurements and sampling will be conducted after a lapse of at least one week following development to allow the well to stabilize. Water level measurements will be made on wells using a chaulked tape or a battery-operated water level indicator Model 51453, Slope Indicator Company, or using a comparable meter. The water level indicator will be decontaminated between wells according to procedures outlined in Section 3.4 of this document.

Groundwater samples will be taken by the following procedures:

- o Water level measurements will be obtained in each well prior to sampling, using an electronic water level indicator.
- o Bailers will be lowered to the bottom of the screen for sample collection. All personnel handling the bailer will wear clean disposable gloves to avoid contamination of bailer or well.
- o Field measurements of pH, temperature, and conductivity will be taken both at the start and finish of bailing operation.
- o Prior to sampling, three (3) to five (5) well volumes will be evacuated or the well will be bailed dry. Water sample will be collected as soon as the well has recovered to a level sufficient for sampling (within 3 hours

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if possible). The well may be evacuated using a submersible pump. Decontamination of the pump is discussed in Section 3.4. All evacuation water will be collected as commented on previously.

- o Groundwater will be sampled with a teflon or stainless steel bailer and the contents of the bailer poured directly into the sample jar, except for a 1-liter volume which will be retained for heavy metal analysis (this one liter volume must be filtered per EPA methodology before preservation). A dedicated bailer and line will be assigned to each well to avoid cross-contamination during sampling. When testing for volatile organics, samples will be poured directly from the bailer to the sample container to minimize any volatile loss. All water samples will be tested for pH, temperature, and conductivity in the field immediately following collection.
- o Samples will be logged on chain-of-custody forms.
- o Sample jars will be maintained at approximately 4°C by placing them in an ice chest or other suitable container.

After sampling, injection or removal-type tests will be performed on selected wells to determine permeability of the site materials. Using the derived site permeability in conjunction with hydraulic gradients, an analysis of the groundwater flow direction and flow rates will be performed and a projected rate of contaminant migration will be made.

3.3.3 Data Evaluation

The preceding soil and groundwater investigations will provide the information to develop the following:

- o Preparation of a groundwater contour map, a site stratigraphic column, geologic cross-sections showing depths of contamination.

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- o Determination of levels and extent of contaminants in groundwater, contaminant behavior, direction and flow rate of groundwater, and permeability of the unconsolidated sediments.

3.3.4 Chemical Analyses

Based on the review of existing data (Section 2.2), it is proposed that 3 soil samples and 2 sets of groundwater samples will be selected from each boring/well for chemical analysis, for a total of 18 soil samples and 12 groundwater samples. The two sets of groundwater samples will be collected in different wet/dry seasons. In addition, one sample of drilling mud (if used) will be analyzed. The analyses recommended for these samples are the same as for surface samples (HSL volatiles, HSL metals, cyanide, phenols). As indicated in Section 3.1.2, groundwater samples collected from Wells #2 and 6 will be analyzed for the full list of HSL parameters.

Analyses will be performed by Ebasco's laboratory HEAI.

3.4 Equipment Decontamination

As presented below, all equipment involved in field sampling activities including drilling rigs, downhole tools, augers, pumps, and soil and water samplers, will be decontaminated prior to and subsequent to sampling and boring events. Equipment leaving the site will also be decontaminated as called for in the Health and Safety Plan.

Drilling rigs, rods, bits, etc. will be decontaminated by steam cleaning at a steam cleaning pit. The location of the steam cleaning pit will be identified in the site-specific HASP. Split-spoon, Shelby tube, and grab samplers will be steam cleaned, rinsed with acetone and then rinsed with distilled water. Equipment contaminated with certain residues, e.g., tars and oils, may require soap scrubbing prior to any other cleaning.

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TABLE 3.1

SURFACE WATER, SEDIMENT AND SOIL/SLUDGE
SAMPLE COLLECTION MATRIX

LOCATION	DESCRIPTION	SOIL/SLUDGE	SEDIMENT	SURFACE WATER
1	Leaching Pit	X		
2	Leaching Pit	X		
3	Leaching Pit	X		
4	Leaching Pit	X		
5	Leaching Pit	X		
6	Leaching Pit	X		
7	Leaching Pit	X		
8	Leaching Pit	X		
9	Leaching Pit	X		
10	Foot of Slope	X		
11	Tributary		X	X
12	Foot of Slope	X		
13	Tributary		X	X
14	Foot of Slope	X		
15	Tributary		X	X
16	Stream		X	X
17	Stream		X	X
18	Downstream Pond		X	X
19	Marsh Area	X		
20	Marsh Area	X		
21	Upstream Pond		X	X
		<hr/> 14	<hr/> 7	<hr/> 7

FIGURE 3.1
PROPOSED SURFACE WATER
AND SEDIMENT SAMPLING
LOCATIONS

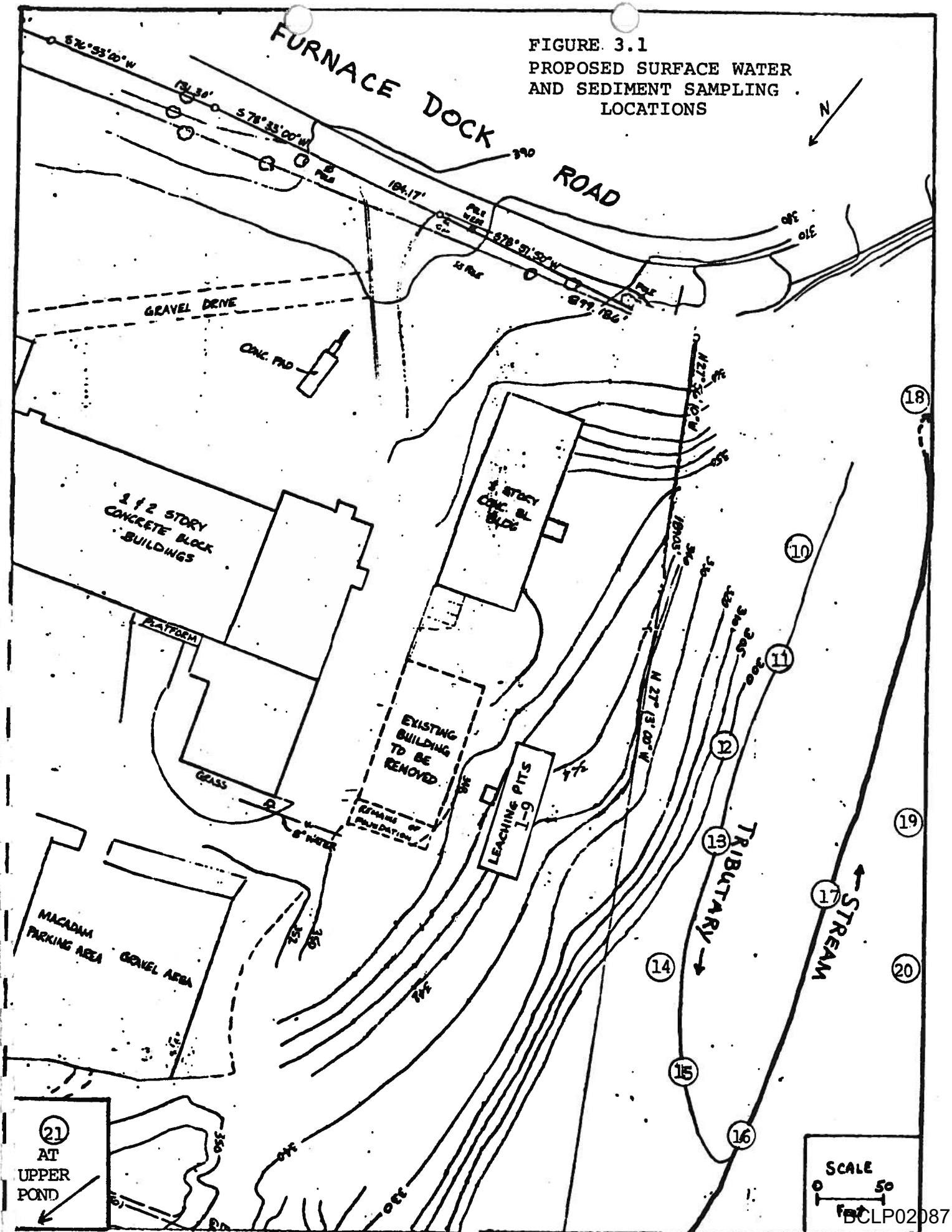


FIGURE 3.2
PROPOSED GEOPHYSICAL
SURVEY GRID

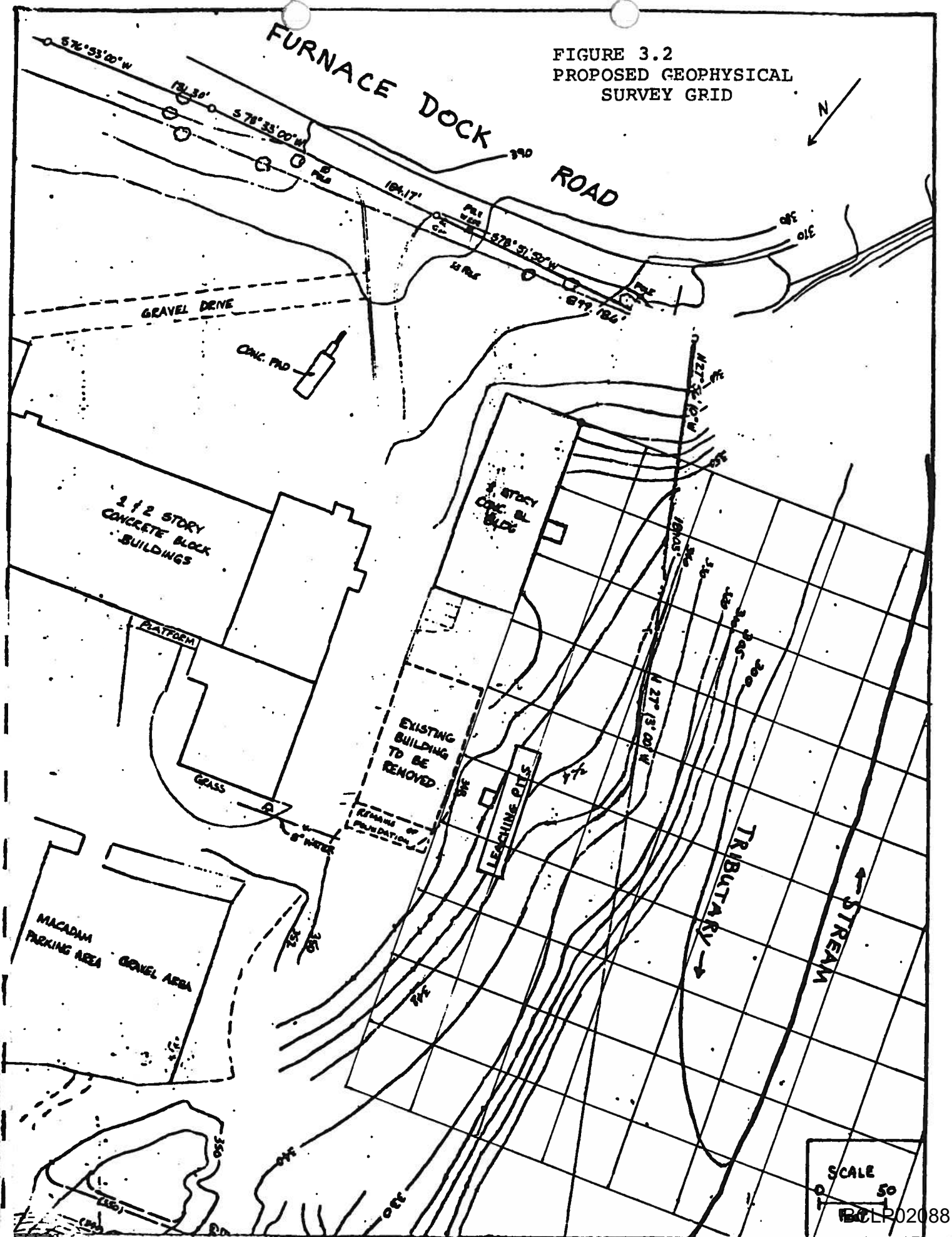


FIGURE 3.3
PROPOSED BORING/WELL
LOCATIONS

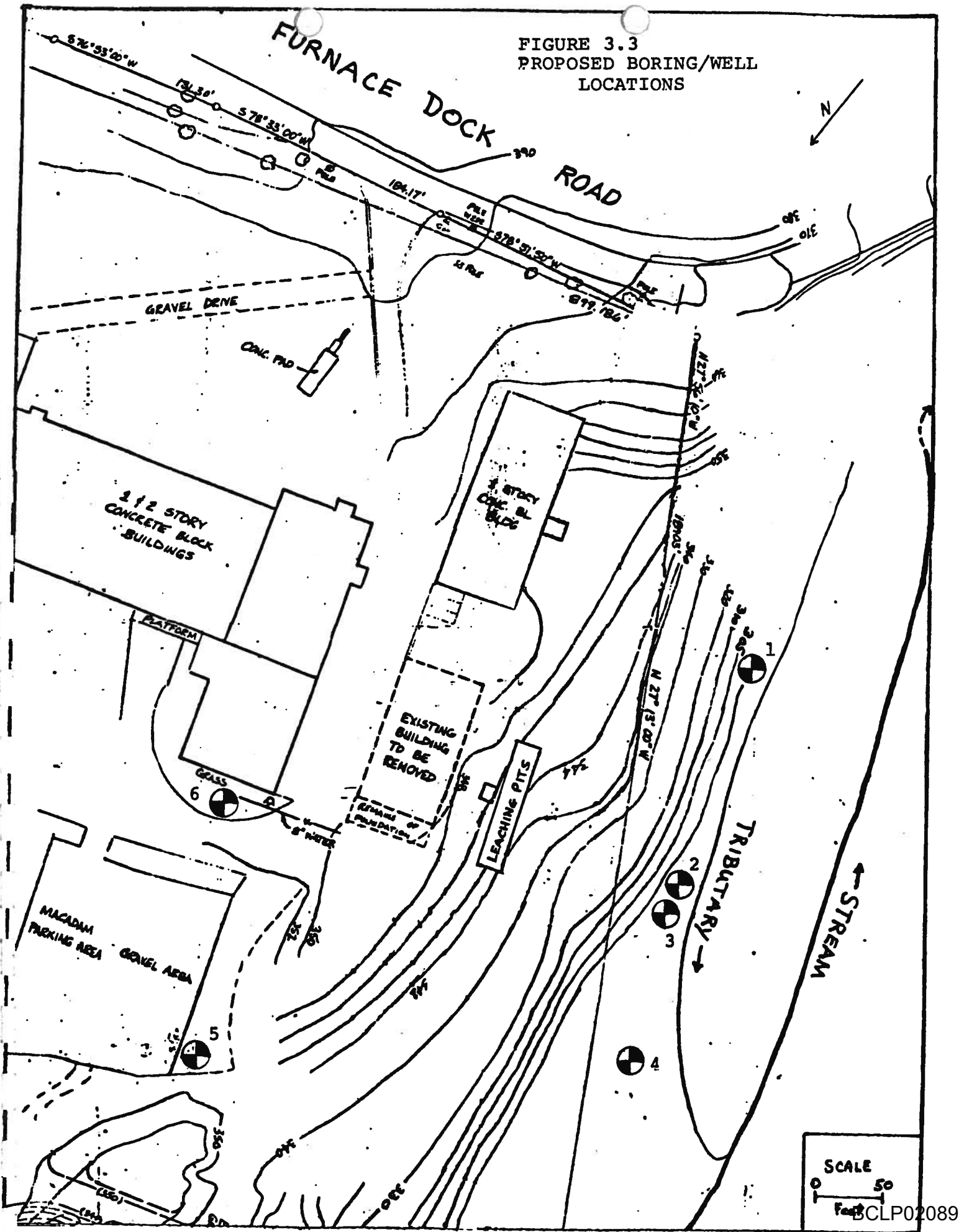
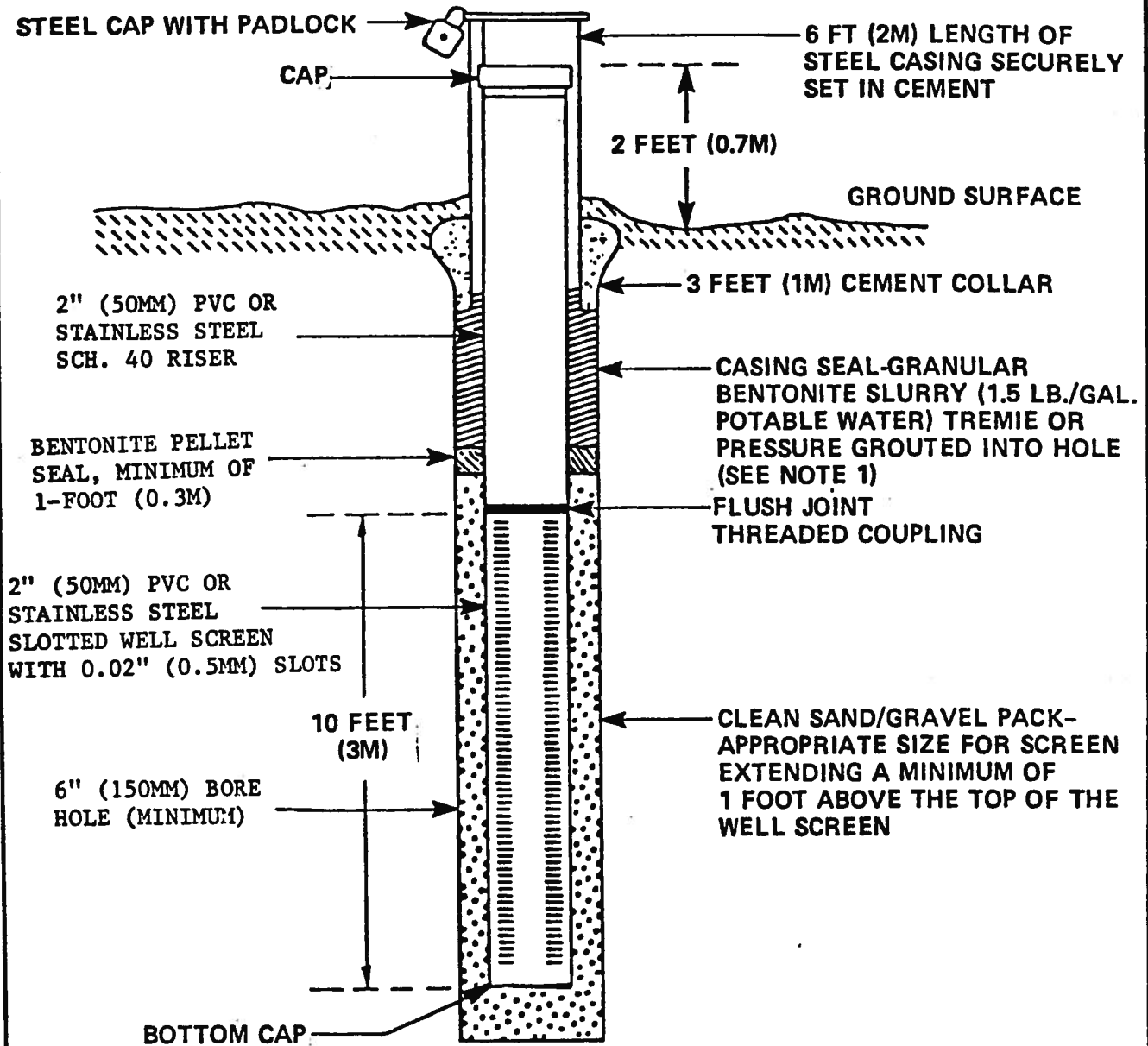


Figure 3.4

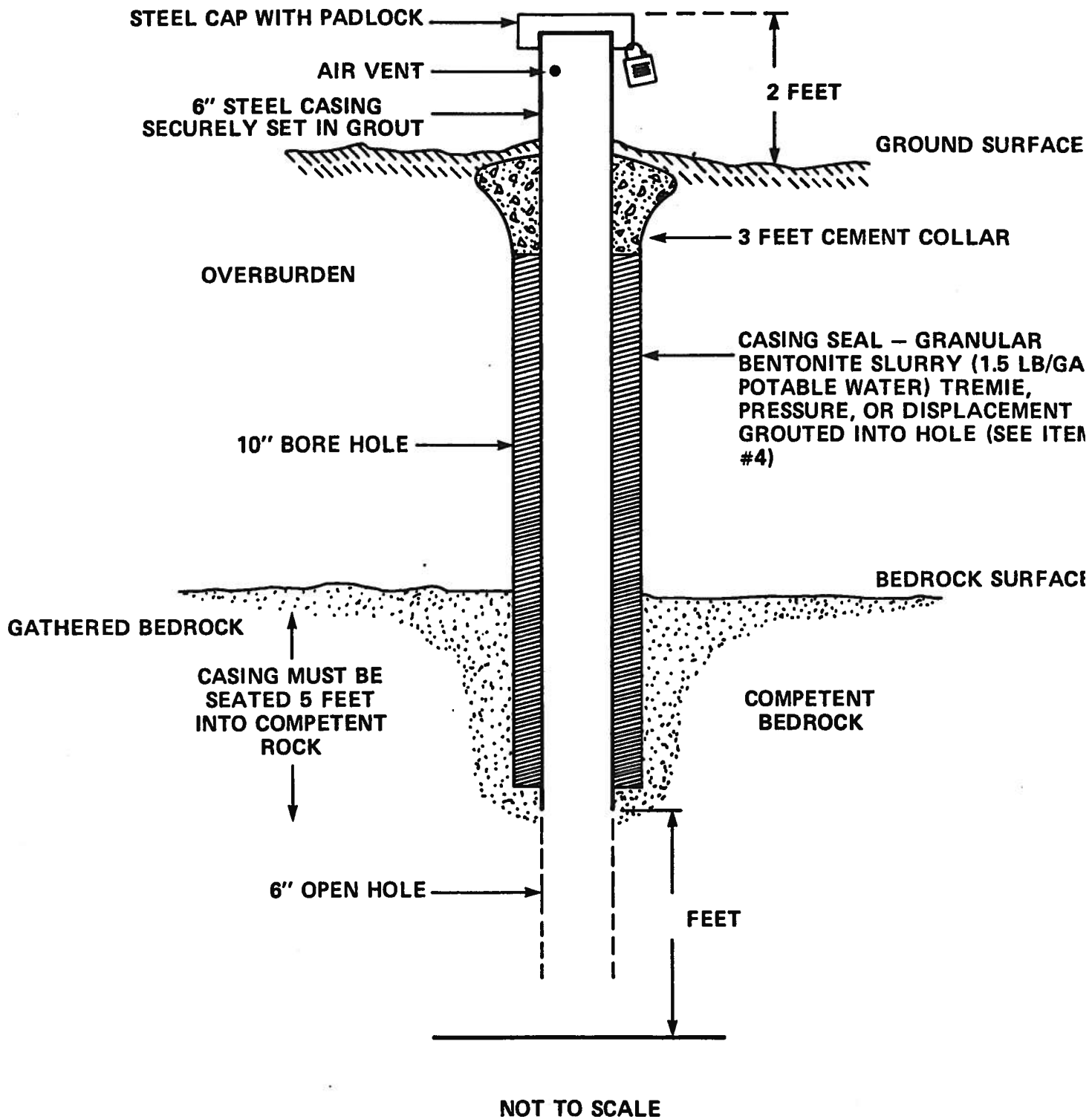
TYPICAL GROUNDWATER MONITORING WELL



NOTES:

1. IN SHALLOW WELLS OF DEPTH 15' OR LESS, BENTONITE PELLET SEAL WILL BE EXTENDED IN LIEU OF GRANULAR BENTONITE SLURRY.

FIGURE 3.5
TYPICAL BEDROCK MONITORING WELL



4.0 QUALITY ASSURANCE/QUALITY CONTROL PLAN (QA/QC)

A draft site-specific QA/QC Plan has been prepared to assure generation of accurate and precise data of acceptable quality (see Appendix D). Ebasco recognizes that each activity of the investigation, design and construction services must be documented and that all results and conclusions must be traceable and justifiable. The findings of a hazardous waste site study may come under court review or be challenged by other experts. Accordingly, Ebasco will establish and maintain high quality and integrity of all elements of the study and will assure the quality of its performance and that of its subcontractors. The QA/QC plan will include sampling and analytical procedures, sample chain-of-custody, equipment calibration and frequency requirements, data reduction, validation and reporting format, internal quality control checks, performance and system audits, preventive maintenance and procedures to assess data precision, accuracy and completeness.

Table 4.1 is a summary of the QA/QC plan for the field program. Field blanks for each matrix sampled will be collected and analyzed for HSL VOAs, HSL metals, cyanide and phenols. A trip blank will be included for VOA each day samples are sent to the laboratory. Duplicates and matrix spikes are included for each matrix to address reproducibility and percent recovery/method accuracy, respectively.

TABLE 4.1
CHEMICAL ANALYSIS PROGRAM FOR FOR FIELD QA SAMPLES
SURFACE AND SUBSURFACE SAMPLING PROGRAMS

<u>Sample Type</u>	<u>Number of Samples</u>	<u>HSL Volatile Organics</u>	<u>HSL Metals</u>	<u>Cyanide and Phenols</u>	<u>Other HSL Parameters</u>
Trip Blanks	15	X			
Field Blanks	5	X	X	X	X
Duplicates					
Surfacewater	1	X	X	X	
Sediments/Soils	1	X	X	X	X
Sludge	1	X	X	X	
Groundwater	1	X	X	X	
Soils	1	X	X	X	
Matrix Spikes					
Surfacewater	1	X			
Sediments/Soils	1	X			
Sludge	1	X			
Groundwater	1	X			
Soils	1	X			

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5.0 PROGRAM SCHEDULE

The proposed field program can be scheduled in two time frames. That is, Tasks 1 (Surface Sampling) and 2 (Geophysical Survey) may be performed sequentially or in parallel. Under the sequential option, the geophysical survey would be performed following review of the Task 1 laboratory data. At this juncture, it is not anticipated that the surface sampling program laboratory results will significantly alter the geophysical program. Therefore, it is proposed that Tasks 1 and 2 be performed in parallel.

FIG 5.1

ESTIMATED PROJECT SCHEDULE⁽¹⁾

<u>Activity</u>	<u>Calendar Time (Weeks)</u>
Schedule and Prepare for Field Sampling Program	3
Field Surface Sampling Program	1
Geophysical Program	1
Laboratory Analyses	4
Geophysical Data Analysis and Report	3
Surface Water Data Analysis and Report	2
Boring and Well Installation	3
Groundwater Sampling	1
Laboratory Analysis	4
Draft Report and Ranking	3

1) NOTES

Certain tasks listed in this table will be performed in parallel.
The surface sampling and boring and well installation programs are sequential.

6.0 HEALTH AND SAFETY PLAN

Ebasco has developed its corporate Health and Safety Program to assure the health and physical safety of Ebasco's employees, subcontractors, third parties and the general public during the conduct of work associated with hazardous waste site activities. The Program also serves to assure procedural uniformity by integrating the various tasks associated with hazardous waste site activities with pertinent health and safety procedures and practices thereby promoting safety without sacrificing efficiency. The site-specific Health and Safety Plan is developed from the Ebasco Health and Safety Program.

Salient features of the Health and Safety (H and S) Program include:

- o Uniform baseline medical and followup examinations of all workers assigned to the hazardous waste site operations by Executive Health Examiners, a nationwide medical consulting firm offering a strong pool of expertise, rapid turnaround time for routine exams (less than 48 hours) and quicker responses when necessary;
- o Rapid supplemental medical and toxicological opinion and referrals from a Support Group including William Wanago, M.D., Director of Medicine of Executive Health Examiners; and the Ebasco Health and Toxicology staff;
- o An appropriate training program in Health and Safety;
- o A formal appraisal/audit inspection program to assure compliance with all H and S program elements;
- o An independent reporting structure which provides H and S checks and balances;
- o An "unusual occurrence" reporting mechanism to assure rapid evaluation and corrective actions as required;

- o A periodic distribution of Health and Safety procedural guidelines to disseminate Health and Safety information to the field workers; and
- o A mechanism to improve the Health and Safety program and site-specific plans.

Both the corporate Program and the site-specific plans mentioned above are dynamic documents and contain mechanisms for revision in order to maintain the highest degree of safety for site work. In addition, development of a plan for a specific site follows prescribed procedures including a review of existing data, preliminary site survey, initial risk assessment, and a corporate review process. These procedures also include concepts for initial site entry under worst case assumptions, with provision for downgrading the protection levels as soon as practical thereafter and during field operations, to optimize work efficiency, safety, project schedule and cost-effectiveness. Highlights of the plan include:

- o Designation of site safety zones;
- o Varying site zones with different operations;
- o Requiring different levels of protection relative to site activities;
- o Monitoring requirements for personnel and areas;
- o Emergency procedures;
- o Decontamination procedures; and
- o Identification of personnel authorized to enter site or exclusion zone.

Ebasco recognizes the importance of Health and Safety for the welfare of its own and subcontractor's employees as well as the general public. For example, precautions taken to protect third parties from injury, and enhance public confidence in activities at hazardous waste sites, include:

- o Limiting access to the support zone unless said third parties have proof of completion of medical examinations and adequate training;
- o Performing personnel and ambient air monitoring during field activities;
- o Rigorous decontamination of personnel and equipment within the contamination reduction corridor; and
- o Approved packaging, labelling and transport of samples and bulk wastes, to ensure no offsite contamination occurrences.

Ebasco also recognizes that Health and Safety assurance is a responsibility extending throughout the organizations to all Ebasco and subcontractor employees. The primary responsibility for Health and Safety rests with those responsible for carrying out the various phases of project operations. For these reasons, an efficient reporting structure, having appropriate checks and balances, has been created for Health and Safety.

Ultimate responsibility for the Health and Safety Program and its Plans is borne by the President of Envirosphere Company, a division of Ebasco having the programmatic corporate responsibility for hazardous waste site activities. He has delegated to the Manager of Health and Safety, the responsibility and commensurate authority to act for him in all matters pertaining to Health and Safety. He will be responsible for the establishment and interpretation of standards and guidelines; the initiation of policy review; the approval of procedures; the assurance of compliance with the Health and Safety Program and its Plans; and provisions of technical and consultative support to all contractors including risk assessment, manpower and monitoring. Within the Program organization, the Manager of Health and Safety reports directly to the Vice President, in this case the Vice President of Eastern Environmental Operations. Each site will have an H and S Officer whose assignment is to monitor site conditions, to ensure the full implementation of the H and S Plan, and to cause immediate and appropriate response to any hazardous condition or action on site. The site H and S Officer reports to both the Project Manager and the H and S Manager. The purpose of this organization structure is to provide ultimate control of H and S by Ebasco and to create a mechanism by which potential major H and S problems can rapidly resolved.

The full implementation of approved H and S Plans will require that all on site personnel receive site-specific health and safety training from the H and S Officer assigned to the project.

Compliance with the Site H and S Plan will be assured by external and internal H and S performance and systems audits conducted by the H and S Manager and/or his support staff. Such audits will include unannounced site visits to observe technical compliance with all elements of the site H and S Plan.

7.0 PHASE II INVESTIGATION REPORT FORMAT

The results of this proposed Phase II investigation will be presented in a written report developed according to the general guidelines of the NYSDEC Generic Work Plan for Phase II Investigations (July, 1985). This report will include appropriate sections relating to the following:

- o Site History,
- o Site Assessment, and
- o Application of the Hazard Ranking System.

The site assessment section will include discussions relating to the site topography, hydrology, and overall site observations. The hydrological discussion will be based upon the results of boring and groundwater monitoring programs. Also included in the site assessment section will be an evaluation of the results of the surface and subsurface soil, sediment, and water chemical analysis programs.

8.0 REFERENCES

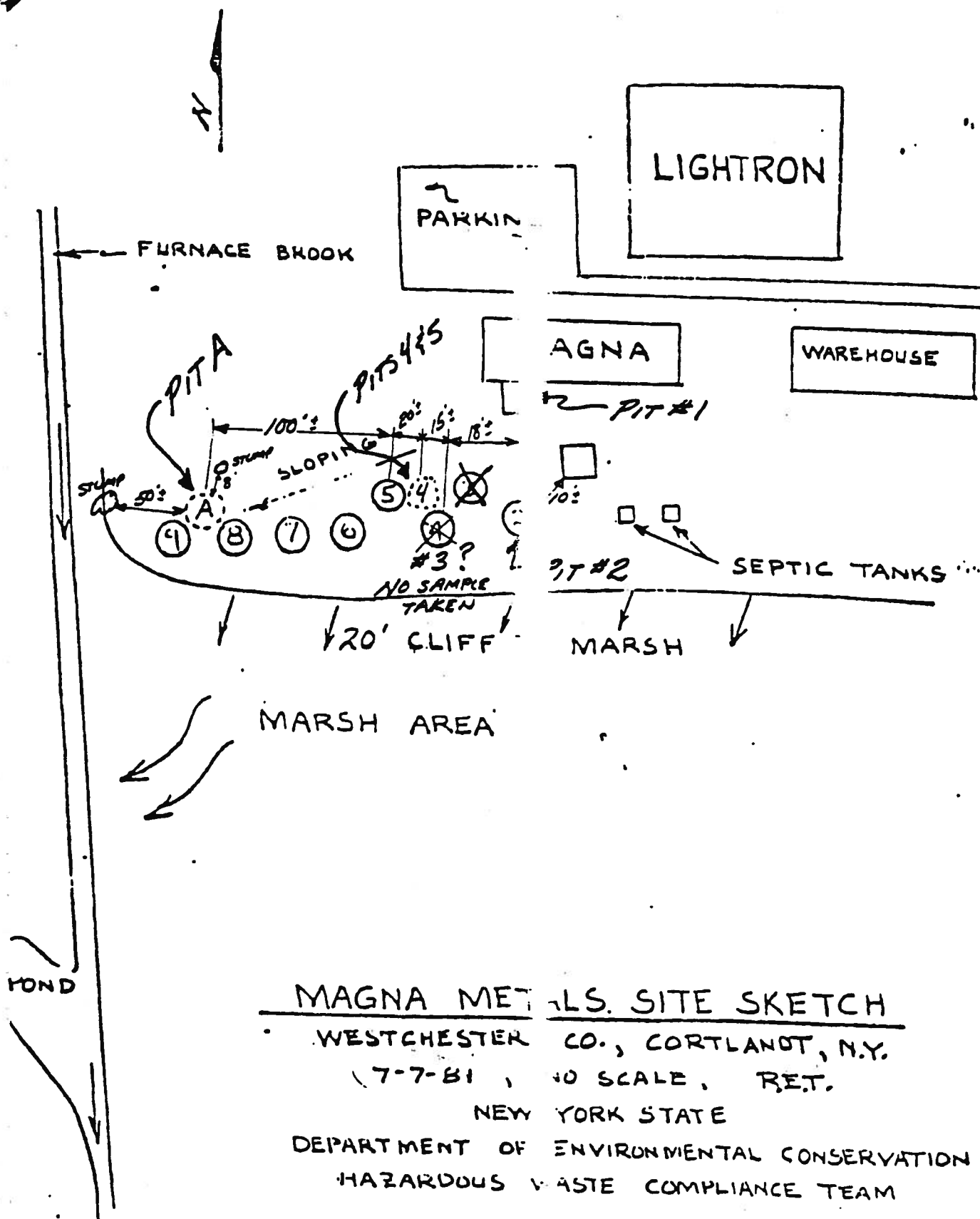
1. American Society for Testing and Materials. 1980. Standard practice method for soil investigation and sampling by auger borings. ANSI/ASTM D 1452-80. Philadelphia, Pa.
2. American Society for Testing and Materials. 1967. Standard method for penetration test and split-barrel sampling of soils. ASTM D 1586-67. Philadelphia, Pa.
3. US Environmental Protection Agency. 1983. Methods for chemical analysis of water and wastes. EPA-600/4-79-020. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.
4. US Environmental Protection Agency. 1982. Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. EPA-600/4-82-057. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.
5. US Environmental Protection Agency. 1982. Handbook for Sampling and Sample Preservation of Water and Wastewater. EPA-600/4-82-029. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.
6. US Environmental Protection Agency. 1980. Samplers and Sampling Procedures for Hazardous Waste Streams. EPA-600/2-80-018. Municipal Environmental Research Laboratory, Cincinnati, Ohio.
7. US Environmental Protection Agency. 1982. Test methods for evaluating solid waste. SW-846, 2nd Edition. Office of Solid Waste and Emergency Response, Washington, DC.
8. US Environmental Protection Agency. 1979. Modified EMSL-C1 procedure to be used for low levels of volatiles in soils and sediments. USEPA Contract 68-01-6762.
9. New York State Department of Environmental Conservation (NYSDEC). 1985. Generic Work Plan for Phase II Investigations.

APPENDIX A
CORTLANDT SITE DATA

CHEMICAL DATA

APPENDIX A

EXHIBIT A - APPROXIMATE LOCATION FROM WHICH
SAMPLES WERE TAKEN ON 8/19/82



MAGNA METALS SITE SKETCH

WESTCHESTER CO., CORTLANDT, N.Y.

(7-7-81, NO SCALE, RET.)

NEW YORK STATE

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

HAZARDOUS WASTE COMPLIANCE TEAM

BCLP02104

LABORATORY REPORT

Job No. J-964 Date Sept. 20, 1982

Client **William F. Cosulich Assoc.**
20 W. Ridgewood Ave.
Ridgewood, NJ 07450
Att: Jim Kelly

Sample(s) Reference

Sludge Pits on
ISC Properties

State samples () received (x) collected by General Testing 3/19/82

ISC

ANALYTICAL RESULTS

(mg/l unless stated otherwise)

Sample Description	2 Pit 1	1+ Pit A	3* Pit 2	4* Pit 4	5* Pit 5
late(s) Time(s)					
pH **	9.4		8.2	6.4	6.9
Cyanide	.42		2.3	.91	.38
Chlorides	62		44	9	3
Phenolics	.009	.015	.015	.010	.012
Sulfates	42	<5	134	182	<10
Nitrates	.67	12	1.29	4.5	.94
Cadmium	0.03	<0.025	<0.025	<0.025	<0.025
✓ Chromium, Total	<0.05	<0.05	<0.05	<0.05	<0.05
Chromium, Hex	<0.01	<0.01	<0.01	<0.01	<0.01
✓ Copper	23.9		176	38.4	0.60
Iron	0.90		<0.05	<0.05	0.82
Lead	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	0.04		1.52	1.73	1.9
✓ Nickel	4.2	1	26.6	94	8.3
Zinc	0.42	50	74	81	14

* Analysis on EP Toxicity Extract; Federal Register, Vol. 45, No. 98, procedures in accordance with v 19, 1980, Rules & Regulations

** Analyses on 10% solution w/v

Analytical procedures in accordance with Standard Methods for the Examination of Water and Wastewater, 14th Edition and Methods for Chemical Analysis of Water and Wastes, EPA.
(<) indicates lowest detectable concentration with procedure used

Richard J. Kelly
Laboratory Director

Job No. J-964 Date Sept. 20, 1982

LABORATORY REPORT

William F. Cosulich Assoc.
20 W. Ridgewood Ave.
Ridgewood, NJ 07450
Att: Jim Kelly

Sample(s) Reference

Quality Control Report

☐ te samples ☐ received ☒ collected by General Testing 8/19/82

ANALYTICAL RESULTS

(mg/l unless stated otherwise)

Sample Description	Duplicates		EPA Standard Recovery %	Spiking		Recovery %
	1st Value mg/l	2nd Value mg/l		Amt. Added mg	Amt. Recovered mg	
Date(s) Time(s)						
Chlorides	3	3	107	15.00	15.16	101
Sulfates	45	38	84	20	21.5	108
Nitrates	.94	.96	101	1.00	1.09	109
Cadmium	<0.025	<0.025	100	0.05	0.05	100
Chromium Tot.	<0.05	<0.05	93	0.05	0.05	100
Copper	0.60	0.60	104	0.60	0.49	82
Iron	0.84	0.82	97	0.40	0.43	108
Lead	<0.1	<0.1	100	0.1	0.1	100
Manganese	1.9	1.9	94	0.04	0.04	100
Nickel	8.3	7.8	102	0.60	0.53	88
Zinc	14.0	14.0	98	0.05	0.05	100

Analytical procedures in accordance with Standard Methods for the Examination of Water and Wastewater, 14th Edition and Methods for Chemical Analysis of Water and Wastes, EPA.
(<) indicates lowest detectable concentration with procedure used

Richard Schickel

Laboratory Director

GENERAL TESTING CORP.
CHAIN OF CUSTODY RECORD

Sampling Place: LIGHTKON

LINNAE ROCK ROAD PEEKSKILL NY
 Street City State

Sample Source: _____ Producer _____ Hauler _____ Disposal Site _____
 Other _____

Shipper Name: _____

Shipper Address: _____
 Street City State Zip

Shippers Telephone # () _____

Collector's Name: RICHARD SCHEIBLE ; [Signature]
 Print Signature

Field Information: 0.5m, 80°C -

Relinquished by:	Received by:	Date/Time
1. sign. _____	1. sign. _____	/
for _____	for _____	/
2. sign. _____	sign. _____	/
for _____	for _____	/
3. sign. _____	sign. _____	/
for _____	for _____	/

Received for Laboratory by: _____

Method of Shipment: _____

Sample	Sample Location	Date	Time	Sample Type	Number of Containers
MANHOLE COVER (1)	STUMP-XL X 4.5" DEEP	8/19/82	11:00	COMPOSIT 5	1 TEFLON SAND
IT #5 (5)	Augment for DEC	8/19/82	11:40	COMPOSIT 5	2 TEFLON SAND - 1 DO. FOR DE.
IT #4 (4)		8/19/82	12:00	COMPOSIT 5	1 TEFLON SAND
IT #2 (3)		8/19/82	12:15	COMPOSIT 5	1 TEFLON SAND
IT #1 (2)	WATER ONLY 40.5" DEEP	8/19/82	12:50	GRAB SAMPLES	2 TEFLON } DEC TACK 2 PLASTIC } 1 SET

Water County Health Department
 Report
 File Furnace Brook
 Corridor ()

Other results for parameters
 2.3 in Ppb, 4.1 in Ppm
 all results for parameters

Date of Sampling: 2/2/83
 either one

Day of sampling: rain
 Day previous: fair
 SAMPLING LOCATIONS:

1. 100' Above Field Pond

2. Tributary parallel to and south of
 old excavated area, NW corner of area

3. Tributary beyond streambed wetlands

4. About 200' above site drainage

Sample Type	Water
Form TC-1	

1	TCE (ppb)	130	65	11	<1
2	Cis 1,2 Dichloroethylene (ppb)	15	7	4	<1
3	1,1,1 Trichloroethane (ppb)	43	<1	<1	<1
4	Fe	.30	.34	.70	.58
5	Cu	.09	.10	<.02	.07
6	Zn	<.05	.05	<.05	<.05
7	Ni	<.01	<.01	<.01	<.01
8	Cd	<.002	<.002	<.002	<.002
9	Cr	<.01	<.01	<.01	<.01
10	Cy	<.01	<.01	<.01	<.01
11	Pb	<.01	<.01	<.01	<.01
12	Mn	.07	.03	.52	.07
13	Fecal col	<30	<30	40	<30
14	- col fu	2400	930	2400	2400
15					
16					
17					
18					
19					
20					
21					
22					

SAMPLE

Steps

1,1,1 Trichloroethane

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

BCLP02109

County Health Department

Report Furnace Brook

File 315181

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
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Results for parameters
1,2,3 in mg/l

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1,2,3 in mg/l

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1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Results for parameters
1,2,3 in mg/l

Form TC-1

Sample Type

WATER

TCE

CIS 1,2 Dichloroethylene

1,1,1 Trichloroethane

PARAMETERS

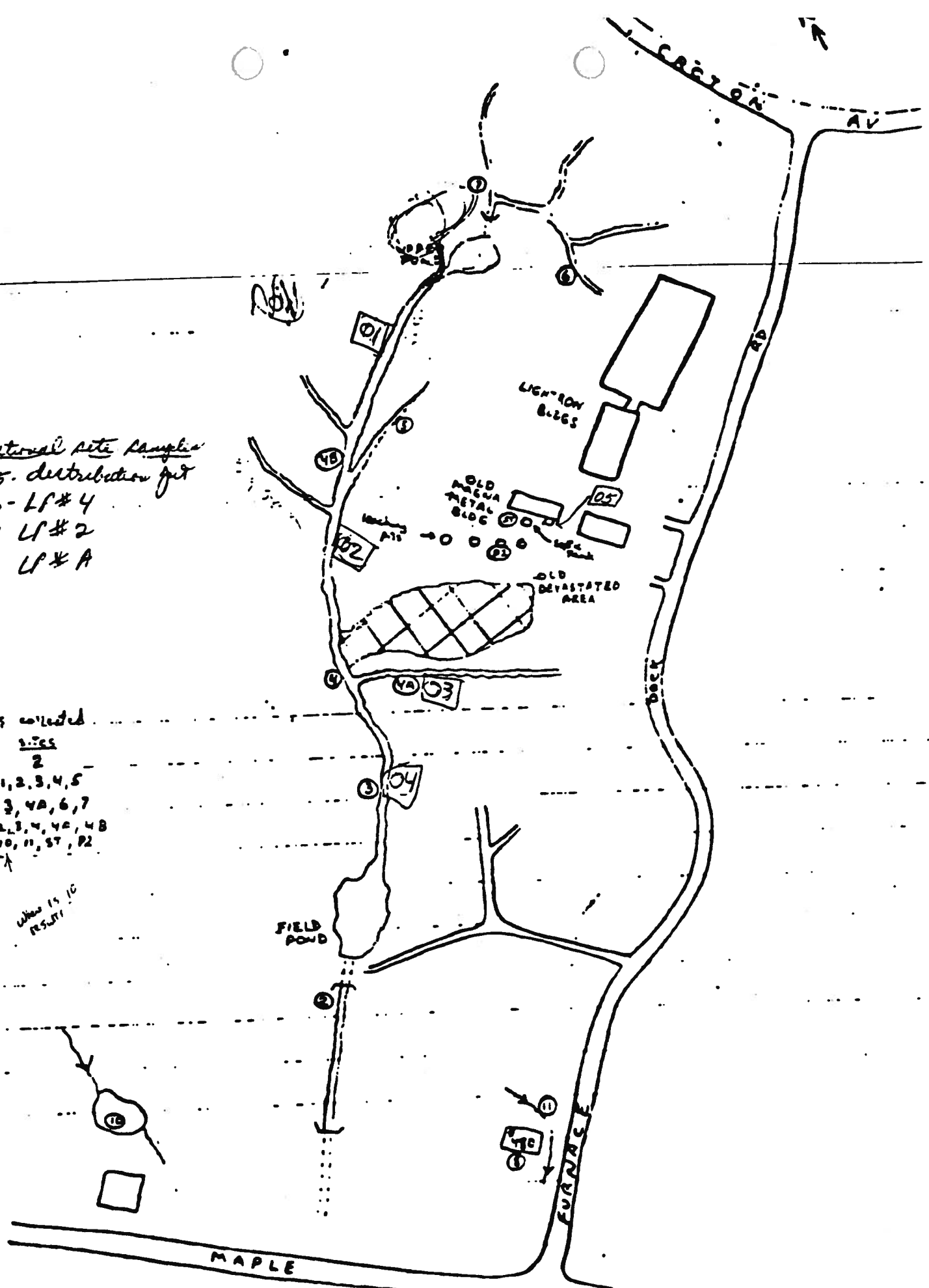
Additional site samples

- 05. distribution pit
- 36- LF# 4
- 17 LF# 2
- 08 LF# A

SAMPLES collected

DATE	SAMPLES
2/1/83	2
2/1/83	1, 2, 3, 4, 5
2/2/83	3, 4A, 6, 7
2/5/83	2, 3, 4, 4A, 4B
	10, 11, 17, 19, 22

notes
 when 15 1/2
 results



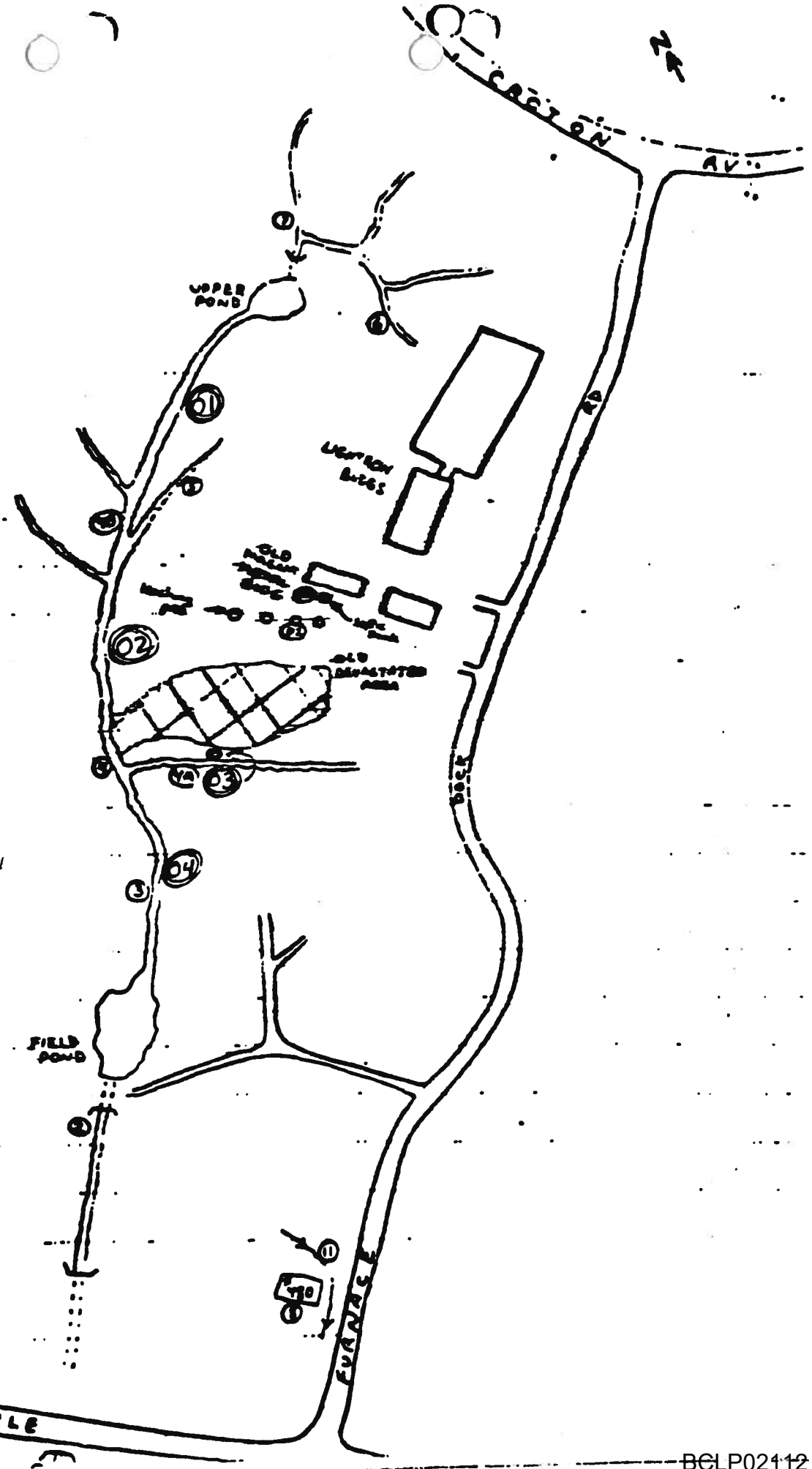
Site 2 - Regular sample, all years

SAMPLES collected

Year	Sites
1971	2
1973	1, 2, 3, 4, 5
1974	3, 4A, 6, 7
1975	2, 3, 4, 4A, 4B
1976	10, 11, 17, 18

1-15-84- DEE SAMPLING
INDICATED IN RED

(C1-C4)





New York State Department of Environmental Conservation

MEMORANDUM

TO: File
 FROM: Todd Ghiosay
 SUBJECT: ISC/Magna Metal Resampling, Cortlandt (T), Westchester Co.
 DATE: June 5, 1984

SAMPLING TRIP REPORT
 DIVISION OF ENVIRONMENTAL ENFORCEMENT

ENFORCEMENT CATEGORY: Inactive

FIELD UNIT: White Plains

SAMPLING DATE: May 15, 1984

1. Sampling Locations: (see attached sketch of site)
2. Sample Description: (see sample table)
3. Laboratory Receiving Samples: Versar, 6850 Versar Center,
P.O. Box 1549, Springfile, VA
4. Sample Dispatch Data:

Location sent from: White Plains DEC Office

Airbill Number: 735 300 683

Date and Time Sent: May 16, 1984, 12:00 noon.

Sent by: Todd Ghiosay, signed out by Bill Rubin

5. Sampling Personnel:

<u>Name</u>	<u>Organization</u>	<u>Duties on Site</u>
Todd Ghiosay	NYSDEC, White Plains	Sample, collection notetaker
Terri Gerrish	NYSDEC, White Plains	Sample, collection
Wesley Gamble	NYSDEC, Albany Core	Sample, collection notetaker

6. Safety Requirements:

- * Latex gloves (for sludge samples)

- * Rubber boots (for water samples)
- * Nitrile gloves (for water samples)
- * Decontamination: solution ofalconox and water scrub and rinse boots and gloves

7. General Information and Observation:

- ° Arrived on site at 1:30 p.m., sampling event completed by 8:00 p.m.
- ° Sample containers

<u>Designated Letter</u>	<u>Container Type</u>	<u>Preservative</u>
A	16 oz. brown glass jar	None
B	250 ml plastic	NaOH to pH >12
C	250 ml plastic	H NO ₃ to pH <2
D	250 ml plastic	None
E	40 ml VOA vials	None
E Duplicate	40 ml VOA vials	None

- ° Weather was breezy with temperatures in the high sixties. Partly sunny in the afternoon changing to overcast skies later in the day.
- ° Recent bulldozing and land clearing took place in a small area west of the old Magna Metals building and in a much larger section on the northern end of the property. A Baker properties representative told me a records warehouse is to be constructed on the northern portion of the property.
- ° T. Gerrish noted that the area near the distribution basin (pit 1) had been disturbed since her visit in 1982. The basin is now covered by slabs of concrete.
- ° While walking Furnace Brook to find sampling points, small amounts of oily materials were observed on the surface of some of the smaller tributaries flowing into Furnace Brook. Small amounts of oil liquids were also observed in the marsh area.
- ° All sample containers were received from Versar accompanied by an information sheet indicating the cleaning procedure used by Versar.
- ° All sludge samples were obtained using small diameter stainless steel augers attached to stainless steel extensions. Each auger tip was cleaned or rinsed in the following order: (a) aslconox and water, (b) tap water, (c) hexane, (d) acetone, (e) alxonox and water, (f) tap water, (g) distilled water.

- All water samples were collected directly into the appropriate jar, then preservatives added immediately.
- All sediment samples were collected using a pre-cleaned polyethylene scoop.
- Field pH was taken with pH papers, and therefore is very approximate.

9. Report completed by Todd Ghiosay on 5/23/84.

<u>Sample Number</u>	<u>Sampling Point</u>	<u>Matrix</u>	<u>Sample Description</u>	<u>Analaysis Requested</u>
P-384-V05-01 A,B,C,D,E, E Duplicate	Upstream north of Magna Metals	-sediment (placed in Container A) -water	-sediment composed of brownish sand and silt -clear water, pH 6	JAR A - Total Metals (7000 series) Volatiles (8240)
P-384-V05-02 A,B,C,D,E, E Duplicate	Mid-stream west of Magna Metals Building	-sediment (placed in Container A) -water	-sediment composed of dark mud and decaying organic matter -clear water pH 5	JAR B - Total cyanide (335.2)
P-384-V05-03 A,B,C,D,E, E Duplicate	Marsh area south west of Magna Metals Building	-sediment (placed in Container A) -water	Same as sample 02 pH 5-6	JAR C - Total metals (7000 series)
P-384-V05-04 A,B,C,D,E, E Duplicate	Downstream south west of Magna Metals Building	-sediment (placed in Container A) -water	Same as sample 02 pH 5	JAR D - alkalinity (310.1) specific conductance (120.1) pH
P-384-V05-05 B,C,D,E, E Duplicate	Distribution tank adjacent to old Magna Metals Building	Water	Slightly yellowish water pH 6-7	JAR E - Volatiles (8240)
P-384-V05-06 A	Leaching Pit #4	Sludge cake	Layered clay like sludge of various colors - Grey, green aquamarine, red layers - small amount of brown sand	-method (8240) -total metals (7000 series) -EP tox for metals

<u>Sample Number</u>	<u>Sampling Point</u>	<u>Matrix</u>	<u>Sample Description</u>	<u>Analysis Requested</u>
P-384-V05-07 A	Leaching Pit #2	Sludge cake	Layered clay like sludge, green, gray red, magenta, lavender layers	Same as P-384-V05-06
P-384-V05-08 B,C,D,E, E Duplicate	Leaching Pit A	Water	Clear water pH 6	Same as P-384-V05-05

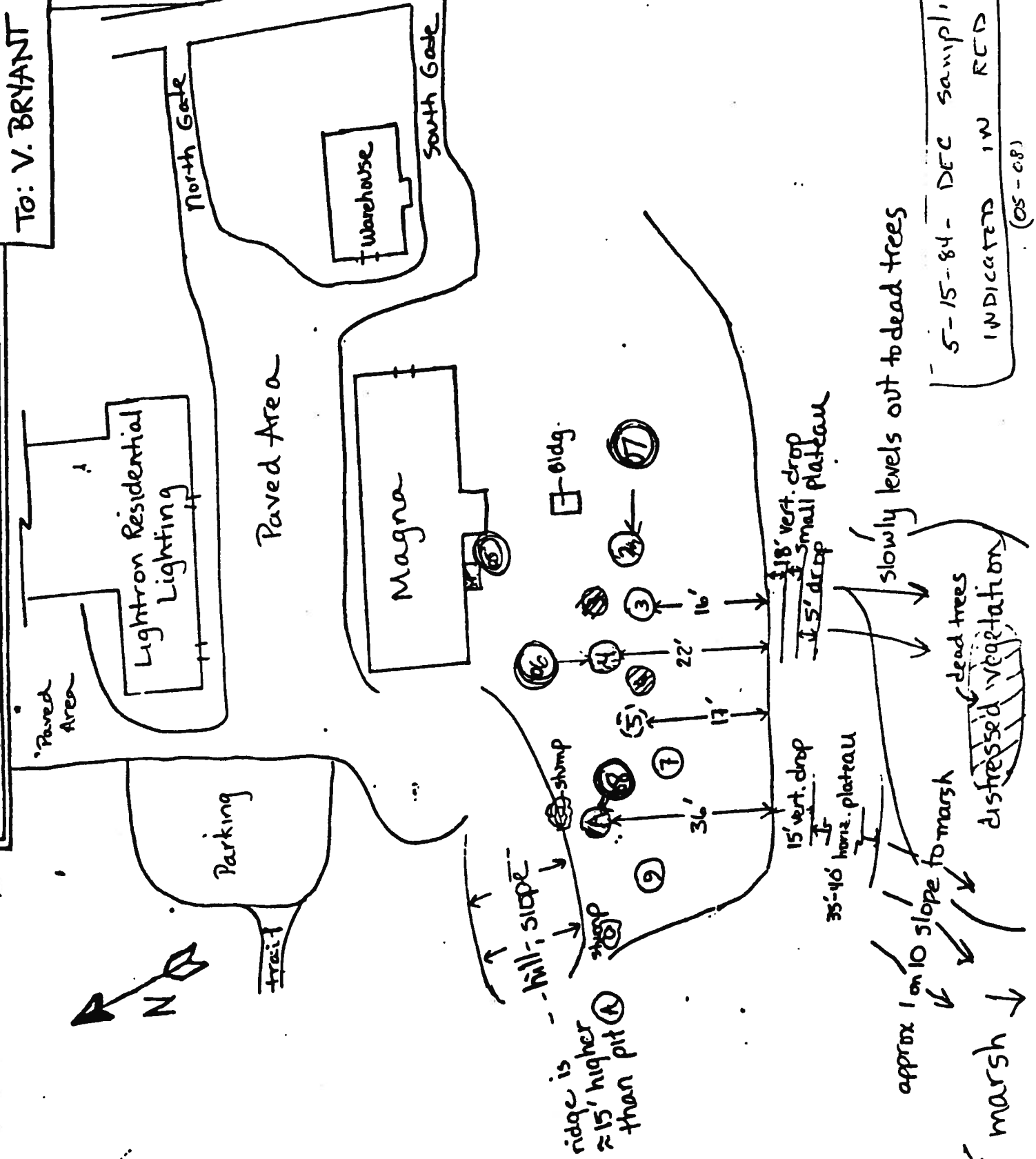
2819111

TO: V. BRYANT

Notes:

(1) Pit ② is approx 8' deep to top of sludge
(2) Pit (A) only contains soil

file Mayra



5-15-84 - DEC sampling
INDICATED IN RCD - (80-80)

Vernal INC.

Sample #:

P 384 V05 01 A

METALS RESULTSDATE: 7-9-84PROJECT #: 857-28LAB #: 994

PARAMETER	DETECTION LIMIT mg/kg.	SAMPLE CONCENTRATION mg/kg
As	0.5	<0.5
Sb	0.5	<0.5
Se	0.5	<0.5
Tl	0.5	<0.5
Hg	0.1	<0.1

PARAMETER	DETECTION LIMIT mg/kg	SAMPLE CONCENTRATION mg/kg
Be	0.1	<0.1
Cd	1.	<1.
Cr	0.4	7.5
Cu	0.4	5.7 ^c
Ni	1.5	30.1
Ag	0.3	0.30
Zn	1.	22.3 ^c

COMMENTS:C = BLANK CORRECTED

Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
USEPA, Washington, D.C. 1982



Robert Maxfield, Lab Manager

Sample #:

P 384 VOS 02 A

METALS RESULTS

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 995

PARAMETER	DETECTION LIMIT mg/kg	SAMPLE CONCENTRATION mg/kg	PARAMETER	DETECTION LIMIT mg/kg	SAMPLE CONCENTRATION mg/kg
As	0.5	0.65	Be	0.1	<0.1
Sb	0.5	<0.5	Cd	1.	<1.
Se	1.†	1.8	Cr	0.4	8.6
Tl	0.5	<0.5	Cu	0.4	115.
Hg	0.1	<0.1	Ni	1.5	40.3
			Ag	0.3	<0.3
			Zn	1.	28.2 ^c

COMMENTS:

C = BLANK CORRECTED

† = DETECTION LIMIT CHANGED DUE TO SAMPLE DILUTION

Procedures in accordance with:
Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
USEPA, Washington, D.C. 1982



Robert Maxfield, Lab Manager

Sledge (series of boxes)
C.R. 7-10-11

P 384 Y05 06 A

DATE: 7-9-84


PROJECT #: 857-28

LAB #: 998

PARAMETER	DETECTION LIMIT mg/kg	SAMPLE CONCENTRATION mg/kg
Be	0.1	<0.1
Cd	1.	3.1
Cr	0.4	223.
Cu	0.4	3690. ^c
Ni	1.5	27500.
Ag	0.3	0.81
Zn	1.	8310. ^c

COMMENTS:
[†] Detection limit changed due to sample dilution.

2: BLANK CORRECTED


Robert Maxfield, Lab Manager

Versar INC.

SLUDGE (top results)
(K₂Cr₂O₇, Cu, Ni,
Zn not listed)

Sample #:

P 384 VOS 07 A

METALS RESULTS

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 999

PARAMETER	DETECTION LIMIT mg/kg	SAMPLE CONCENTRATION mg/kg
As	1. ⁺	5.0
Sb	0.5	<0.5
Se	10. ⁺	13.0
Tl	0.5	<0.5
Hg	0.1	<0.1

PARAMETER	DETECTION LIMIT mg/kg	SAMPLE CONCENTRATION mg/kg
Be	0.1	<0.1
Cd	1.	1.6
Cr	0.4	5.7
Cu	0.4	15,800. ^c
Ni	15	13,800.
Ag	0.3	0.70
Zn	1.	9500. ^c

COMMENTS:

⁺ Detection limit changed due to sample dilution.

C = BLANK CORRECTED

Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
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Robert Maxfield, Lab Manager

VERSAR INC.

Sample #:

P 384 V05 01 C

Total
METALS RESULTS

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 1006

PARAMETER	DETECTION LIMIT $\mu\text{g/l}$	SAMPLE CONCENTRATION $\mu\text{g/l}$
As	10.	<10.
Sb	10.	<10.
Se	10.	<10.
Tl	10.	<10.
Hg	0.4 *	<0.4

PARAMETER	DETECTION LIMIT $\mu\text{g/l}$	SAMPLE CONCENTRATION $\mu\text{g/l}$
Be	1.	<1.
Cd	10.	<10.
Cr	4.	<4.
Cu	4.	<4.
Ni	15.	<15.
Ag	3.	<3.
Zn	10.	21. C

COMMENTS:

*Detection limit changed due to sample dilution.

C = BLANK CORRECTED

Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
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Robert Maxfield, Lab Manager

VERSAR INC.

Sample #:

P 384 Y05 02 C

METALS RESULTS

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 1007

PARAMETER	DETECTION LIMIT μg/l	SAMPLE CONCENTRATION μg/l	PARAMETER	DETECTION LIMIT μg/l	SAMPLE CONCENTRATION μg/l
As	10.	<10.	Be	1.	<1.
Sb	10.	<10.	Cd	10.	<10.
Se	10.	<10.	Cr	4.	<4.
Tl	10.	<10.	Cu	4.	<4.
Hg	0.2	<0.2	Ni	15.	<15.
			Ag	3.	<3.
			Zn	10.	<10. ^c

COMMENTS:

C - BLANK CORRECTED

Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
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(Signature)

Robert Maxfield, Lab Manager

Versar^{INC}

Sample #:

P 384 V05 03 C

T-2
METALS RESULTS

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 1008

PARAMETER	DETECTION LIMIT μg/l	SAMPLE CONCENTRATION μg/l	PARAMETER	DETECTION LIMIT μg/l	SAMPLE CONCENTRATION μg/l
As	10.	<10.	Be	1.	<1.
Sb	10.	<10.	Cd	10.	<10.
Se	10.	<10.	Cr	4.	<4.
Tl	10.	<10.	Cu	4.	<4. ^c
Hg	0.2	<0.2	Ni	15.	<15.
			Ag	3.	<3.
			Zn	10.	<10. ^c

COMMENTS:

c = BLANK CORRECTED

Test Methods for Evaluating
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Robert Maxfield, Lab Manager

VERSAR INC.

Sample #:

P 384 V05 04 C

Tg-2

METALS RESULTS

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 1009

PARAMETER	DETECTION LIMIT $\mu\text{g/l}$	SAMPLE CONCENTRATION $\mu\text{g/l}$	PARAMETER	DETECTION LIMIT $\mu\text{g/l}$	SAMPLE CONCENTRATION $\mu\text{g/l}$
As	10.	<10.	Be	1.	<1.
Sb	10.	<10	Cd	10.	11.
Se	10.	<10.	Cr	4.	<4.
Tl	10.	<10.	Cu	4.	69 ^c
Hg	0.4*	<0.4	Ni	15.	<15.
			Ag	3.	<3.
			Zn	10.	17. ^c

COMMENTS:

* Detection limit changed due to sample dilution.

C = BLANK CORRECTED

Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
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Robert Maxfield, Lab Manager

VERSA INC.

Distribution back

Sample #:

P 384 VOS OS C

Total

METALS RESULTS

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 1010

PARAMETER	DETECTION LIMIT mg/l	SAMPLE CONCENTRATION mg/l	PARAMETER	DETECTION LIMIT mg/l	SAMPLE CONCENTRATION mg/l
As	200.†	550.	Be	1.	<1.
Sb	10.	<10.	Cd	10.	<10.
Se	50.*	237.	Cr	4.	9.2
Tl	10.	<10.	Cu	4.	7810. ^c
Hg	0.2	<0.2	Ni	16.	610.
			Ag	3.	<3.
			Zn	10.	261.

COMMENTS:

* DETECTION LIMIT CHANGED DUE TO SAMPLE DILUTION

C = BLANK CORRECTED

Procedures in accordance with:
Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
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Robert Maxfield, Lab Manager

Versar INC.

Sample #:

P 384 V05 08.C

T.S. = L

METALS RESULTS

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 1011

PARAMETER	DETECTION LIMIT μg/l	SAMPLE CONCENTRATION μg/l
As	10.	<10.
Sb	10.	<10.
Se	50.*	91.
Tl	10.	<10.
Hg	0.2	<0.2

PARAMETER	DETECTION LIMIT μg/l	SAMPLE CONCENTRATION μg/l
Be	1.	<1.
Cd	10.	<10.
Cr	4.	<4.
Cu	4.	670. ^c
Ni	15.	508.
Ag	3.	<3.
Zn	10.	1570. ^c

COMMENTS:

*Detection limit changed due to sample dilution.

C = BLANK CORRECTED

Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
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Robert Maxfield, Lab Manager

Versar

Sample #:

P 384 VOS 07 A

**EP TOXICITY TEST
METALS RESULTS**

DATE: **7-9-84**

PROJECT #: **857-28**

LAB #: **999**

CONCENTRATION IN mg/L			
PARAMETER	DETECTION LIMIT	EP TOXICITY MAXIMUM CONCENTRATION	SAMPLE CONCENTRATION
Arsenic	0.01	5.0	0.037
Barium	0.5	100.0	< 0.5
Cadmium	0.1	1.0	< 0.1
Chromium	0.2	5.0	< 0.2
Lead	0.5	5.0	< 0.5
Mercury	0.002	0.2	< 0.002
Selenium	0.01	1.0	0.180
Silver	0.01	5.0	< 0.01

Procedures in accordance with:

Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
USEPA, Washington, D.C. 1982



Robert Maxfield, Lab Manager

BCLP02129

Versar_{INC.}

Sample #:

P 384 Y05 06 A

**EP TOXICITY TEST
METALS RESULTS**

DATE: 7-9-84

PROJECT #: 857-28

LAB #: 998

CONCENTRATION IN mg/L			
PARAMETER	DETECTION LIMIT	EP TOXICITY MAXIMUM CONCENTRATION	SAMPLE CONCENTRATION
Arsenic	0.01	5.0	0.100
Barium	0.5	100.0	<0.5
Cadmium	0.1	1.0	<0.1
Chromium	0.2	5.0	<0.2
Lead	0.5	5.0	<0.5
Mercury	0.002	0.2	<0.002
Selenium	0.01	1.0	0.220
Silver	0.01	5.0	<0.01

Procedures in accordance with:

Test Methods for Evaluating
Solid Wastes, SW-846, 2nd Edition,
USEPA, Washington, D.C. 1982



Robert Maxfield, Lab Manager